MAGSENSE® INSTRUCTION SHEET

Pioneer-Standard ELECTRONICS, INC.
5403 PROSPECT AVENUE • CLEVELAND, OHIO 44103

MODEL 77A

DUAL SETPOINT

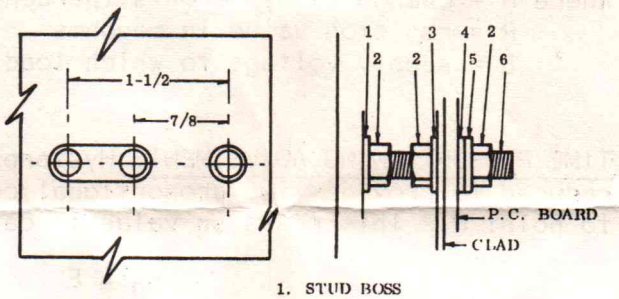
20ua	47163505
100ua	47163501
1ma	47163502
10ma	47163503
100ma	47163504

MAGSENSE^{R} INSTALLATION

CHASSIS MOUNTING Use insulated, tapped spacers between printed circuit board and chassis. board mounting holes will accommodate spacer mounting screws up to 1/4-28 max.

QUICK DISCONNECT MOUNTING The MAGSENSE^{R} comparator can be edge mounted in a printed circuit edge connector such as an Elco 6007-18, Cinch-Jones 250-18, or Amphenol 143-018-01. The clad runout to the edge of the board from the terminal posts extends the circuitry to the connector.

METER MOUNTING The MAGSENSE^{R} comparator can be mounted directly on the studs of a panel meter by means of the through holes provided on the circuit board. In this case the jumper from points N to W must be removed prior to installation. Be sure that the correct polarity is observed. The hardware required is normally supplied with the panel meter being used.



1. STUD BOSS
2. NUT
3. EXTERNAL TOOTH LOCK WASHER
4. FLAT WASHER
5. SPRING LOCK WASHER
6. METER STUD 1/4-28 MAX.

Figure 1

TERMINAL CONNECTIONS. Listed below are the terminal connections for installation of the MAGSENSE^{R} comparator.

Terminal 2	Channel B external set point, positive current raises set point B
Terminal 4	Curcuit ground
Terminal 6	Channel B output
Terminal 8	Negative input signal
Terminal 9	Internal reference voltage.(Approximately 6.5 VDC) Available current for external use not to exceed 2 ma
Terminal 11	+12 VDC supply
Terminal 13	Positive input signal
Terminal 15	Channel A output
Terminal 17	Channel A external set point, positive current raises set point A

CAUTION

Do not use unassigned P C board connector points for tie points.
Do not apply an output voltage greater than 30 VDC.
Do not exceed 100 ma output current.
Do not reverse printed circuit board in connector.

OUTPUT ACTION: The MAGSENSE^R comparator is wired so that Load A is energized when the input is below set point (Reverse Action) and Load B is energized when the input is above set point(Direct Action). To change this operation move the output action resistor, as shown in Figure 2 to the appropriate (D) direct or (R) reverse terminal.

OUTPUT PROTECTION: The MAGSENSE^R comparator is designed for use with resistive output loads. When an inductive load is used a suitable diode (IN4002) should be connected across the load.

HYSTERESIS ADJUSTMENT: The differential between pull-in and drop out of a channel is factory set at less than 3 percent of the model range. Hysteresis can be increased or decreased by the proper sizing of RI3 conncected to point H. This value can be determined by the formula:

$$R = \frac{E}{2H}$$

Where H = change in hysteresis (percentage of range)
R = resistor value in megohms
E = supply voltage to which load is returned

TIME PROPORTIONING ADJUSTMENT: Hysteresis can be reduced to zero or further reduced to provide time proportional control by proper sizing of RI3 connected to point P. This resistor value is calculated by the following formula:

$$Rp = \frac{E}{2P}$$

Where Rp = resistance value in megohms
E = supply voltage to which load is returned
P = proportional band in % of full range

NOTE: These formulas will give approximate values which must be emperically adjusted for accuracy.

EXTERNAL SET POINT: External set points can be provided by means of the divider network shown in Figure 2 (dotted lines). This 10K ohm pot is connected between terminal 9 and circuit ground (terminal 4) with its wiper being connected through a stable 20K resistor to either terminal 17 (Channel A) or terminal 2 (Channel B). NOTE: that the board mounted set point potentiometers must be set at full counter clockwise.

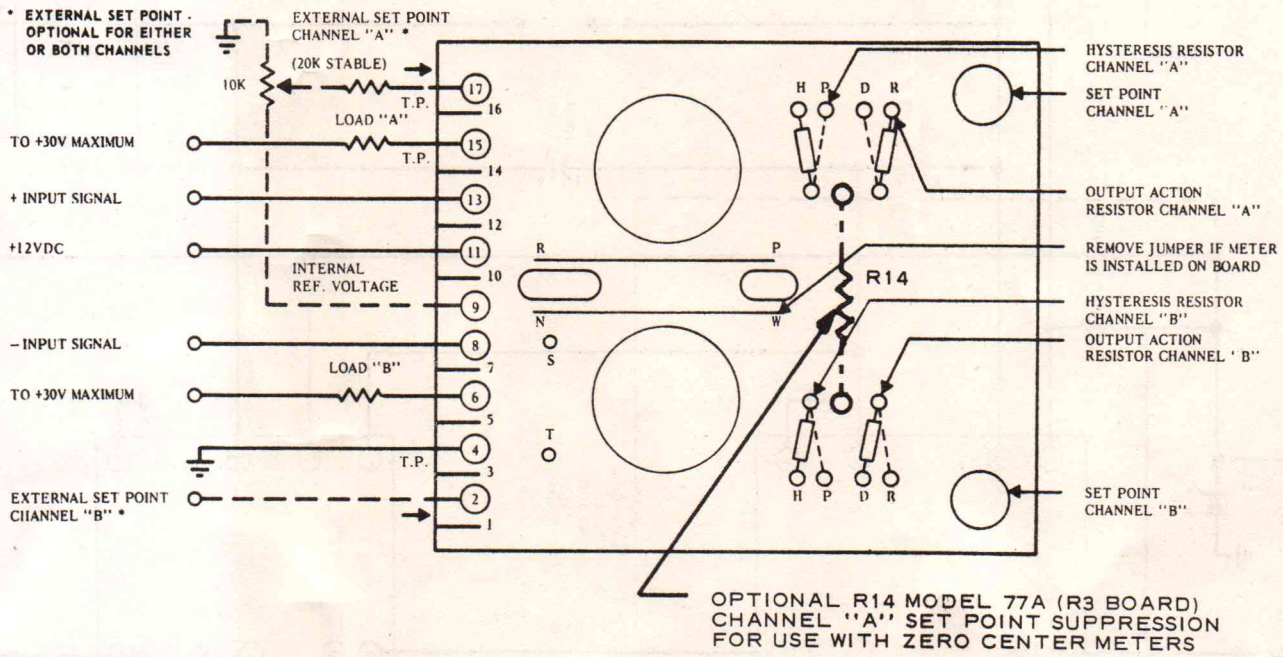


Figure 2

SPECIFICATIONS

Ranges:	20 μa	100 μa	1 ma	10 ma	100 ma
Input Resistance: (Electrically Isolated)	4600 ohms ±600 ohms	210 ohms ± 30 ohms	< 5 ohms	< 1 ohm	< 1 ohm
Set Point Range:	0-20 μa	0-100 μa	0-1 ma	0-10 ma	0-100 ma
Set Point Resolution:	0.2 μa	1.0 μa	10 μa	0.10 ma	1.0 ma
Hysteresis:	0.6 μa max.	3 μa max.	30 μa max.	0.3 ma max.	3 ma max.

Set Point Adjustment:
Two self-contained potentiometers. External set point currents may also be used.

Response Time:
100 milliseconds typical for output current step function traversing set point.

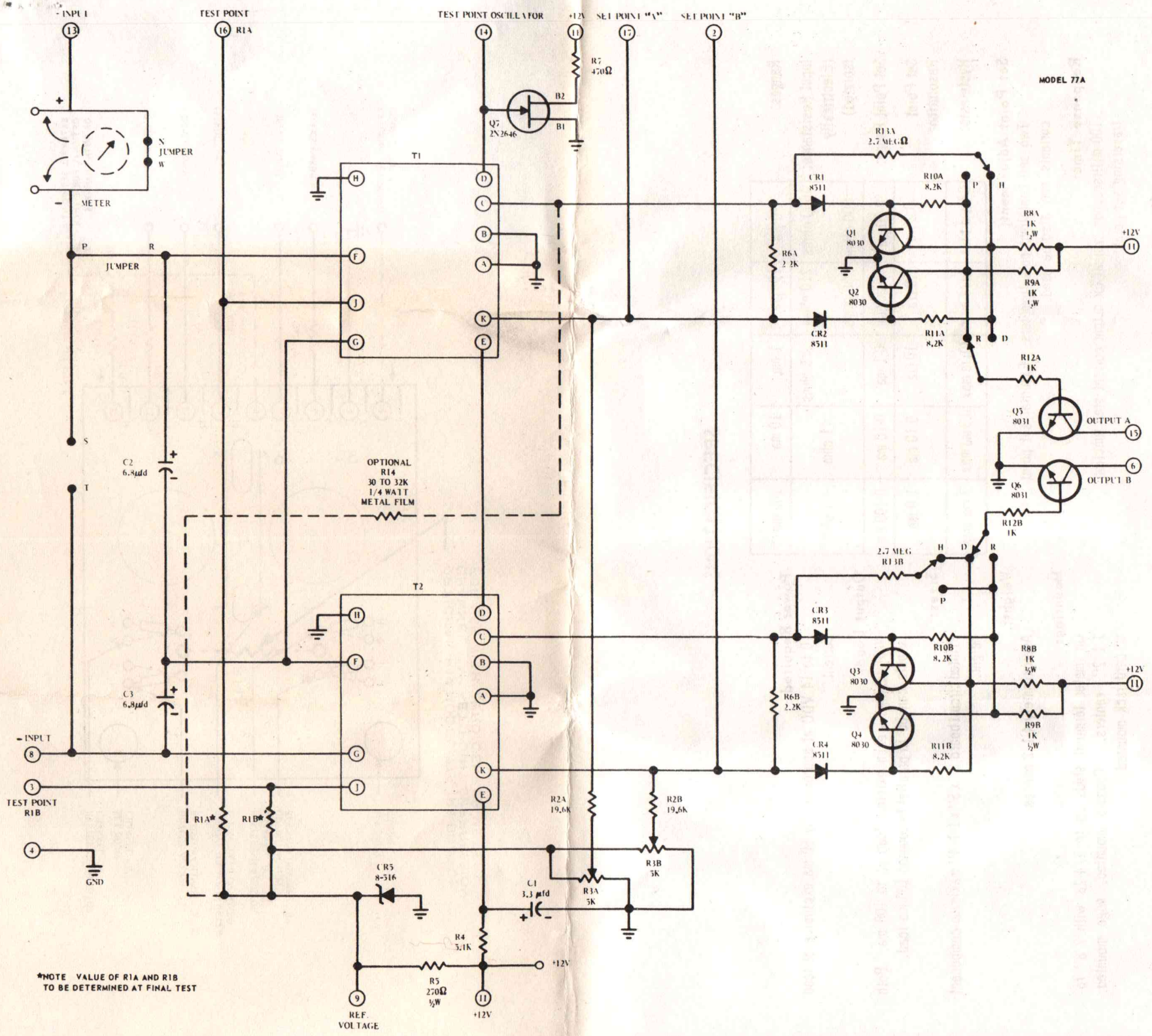
Power Required:
10 to 14 VDC at approximately 50 ma exclusive of load current.

Output Load:
Nonlatching – each external load up to 100 ma. Both outputs can be in parallel to common 100 ma load.

Sizes:
Printed circuit board 3" x 5" x 1-1/4" maximum component height.

Weight:
Approximately 4-1/2 ounces.

Mounting:
On meter terminal studs up to 1/4-28 with 7/8" to 1-1/2" centers. Chassis mounted, edge mounted, or card rack mounted.


- INPUT
TEST POINT
TEST POINT OSCILLATOR
+12V
SET POINT "A"
SET POINT "B"
MODEL 77A
METER
JUMPER
JUMPER
T1
T2
OPTIONAL
R14
30 TO 32K
1/4 WATT
METAL FILM
R7
470Ω
Q7
2N2646
R13A
2.7 MEG Ω
CR1
8511
R10A
8.2K
Q1
8030
Q2
8030
R8A
1K
½W
R9A
1K
½W
R6A
2.2K
CR2
8511
R11A
8.2K
R12A
1K
Q5
8031
OUTPUT A
Q6
8031
OUTPUT B
R12B
1K
R13B
2.7 MEG
CR3
8511
R10B
8.2K
Q3
8030
Q4
8030
R8B
1K
½W
R9B
1K
½W
R6B
2.2K
CR4
8511
R11B
8.2K
C2
6.8μfd
C3
6.8μfd
R1A*
R1B*
R2A
19.6K
R2B
19.6K
R3A
5K
R3B
5K
C1
3.3 μfd
CR5
8-516
R4
3.1K
R5
270Ω
½W
REF.
VOLTAGE
GND
TEST POINT
R1B
*NOTE VALUE OF R1A AND R1B
TO BE DETERMINED AT FINAL TEST